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upon the matter.\* He brings wide knowledge, unbiased judgment and unusual critical acumen to his task, and the result is a work of marked distinction. The various contentions of automatism, parallelism and interactionism are successively examined, and after the expurgation of all fallacies, the residuum of uncontroverted doctrine is elaborated into the theory of psychophysical idealism—a theory closely akin to the panpsychism of Fechner, Clifford and others.

Psychophysical idealism inverts the materialistic view, in accordance with which the brain is the reality and consciousness a mere unsubstantial phenomenon, and maintains that the mind is the reality—the thing-in-itself—of which the brain is the phenomenal manifestation. This sounds at first like a very naïve form of subjective idealism, offensive to all persons of Dr. Johnson's persuasion and to many others less strenuous. And idealism it is, but by no means naïve in the arguments upon which it is based, including, as these do, scholarly considerations of the nature of causation and the law of the conservation of energy, discussions of the pertinent facts in physiological psychology, etc. An adequate critical analysis of Professor Strong's theory is evidently out of the question at this time. It should not be forgotten, however, that theories of this type, while avoiding the crass incongruities of the common forms of materialism, the inconsistencies of interactionism and the inconclusiveness of parallelism, are nevertheless incessantly haunted by the ghost of solipsism. If the solipsistic position be accepted, it then requires a constant miracle, of the kind resorted to by occasionalism, to account for the orderliness of the physical cosmos upon which we are all so unanimously agreed. Whether Professor Strong has wholly avoided the treacherous solipsistic pitfalls, the reader must decide for himself.

JAMES ROWLAND ANGELL.

\*'Why the Mind has a Body,' by C. A. Strong, The Macmillan Company, New York, 1903, pp. x + 355.

#### SCIENTIFIC JOURNALS AND ARTICLES.

*The Journal of Comparative Neurology* for October contains five papers, as follows: (1) 'The Neurofibrillar Structures in the Ganglia of the Leech and Crayfish, with Especial Reference to the Neurone Theory,' by C. W. Prentiss. Establishes fibrillar continuity between the nerve elements, confirming in this respect the conclusions of Bethe and Apáthy. (2) 'On the Increase in the Number of Medullated Nerve Fibers in the Ventral Roots of the Spinal Nerves of the Growing White Rat,' by Shinkishi Hatai. The total number of medullated fibers in the ventral roots of the adult is 2.7 times that of the rat ten days old, and at all ages the total number of medullated ventral root fibers decreases from the spinal cord toward the periphery. (3) 'On the Medullated Nerve Fibers crossing the Site of Lesions in the Brain of the White Rat,' by S. Walter Ranson. Operations on very young rats heal with no appreciable scar and the site of the lesions is crossed by medullated fibers. These are presumably entirely new axones, for the power of regeneration seems to be lost in the adult. (4) 'On the Density of the Cutaneous Innervation in Man,' by Charles E. Ingbert. About 79 per cent. of the medullated dorsal root fibers innervate the skin and 21 per cent. are afferent fibers from muscles and deep tissues. One cutaneous spinal nerve fiber innervates, taking the average of the entire body, 2.05 sq. mm. of the skin. (5) 'On a Law determining the Number of Medullated Nerve Fibers innervating the Thigh, Shank and Foot of the Frog—*Rana virescens*,' by Henry H. Donaldson. The nerve fibers entering the leg being considered as so many separate lines of connection with the several segments, are found to be distributed in accordance with the law that the efferent fibers are present in proportion to the weight of the muscle, and the afferent in proportion to the area of skin.

#### SOCIETIES AND ACADEMIES.

THE CONVOCATION WEEK MEETINGS OF SCIENTIFIC SOCIETIES.

THE American Association for the Advancement of Science, the American Society

of Naturalists and the following affiliated societies will meet at St. Louis, Mo., during the week beginning on December 28.

*The American Association for the Advancement of Science.* The week beginning on December 28, 1903. President, The Hon. Carroll D. Wright; Permanent Secretary, Dr. L. O. Howard, Cosmos Club, Washington, D. C.; General Secretary, Dr. Chas. W. Stiles, U. S. Department of Agriculture, Washington, D. C.; Secretary of the Council, President Chas. S. Howe, Case School of Applied Science, Cleveland, Ohio. *Local Executive Committee*, President, Professor William Trelease; Secretary, Alexander S. Langsdorf.

*Section A—Mathematics and Astronomy.* Vice-president, O. H. Tittmann; Secretary, Professor L. G. Weld, University of Iowa, Iowa City, Ia.

*Section B—Physics.* Vice-president, Professor Edwin H. Hall; Secretary, Professor D. C. Miller, Case School of Applied Science, Cleveland, Ohio.

*Section C—Chemistry.* Vice-president, Professor W. D. Bancroft; Secretary, Professor A. H. Gill, Massachusetts Institute of Technology, Boston, Mass.

*Section D—Mechanical Science and Engineering.* Vice-president, Professor C. M. Woodward; Secretary, Professor Wm. T. Magruder, Ohio State University.

*Section E—Geology and Geography.* Vice-president, Professor I. C. Russell; Secretary, Dr. G. B. Shattuck, The Johns Hopkins University, Baltimore, Md.

*Section F—Zoology.* Vice-president, Professor E. L. Mark; Secretary, Professor C. Judson Herick, Denison University, Granville, Ohio.

*Section G—Botany.* Vice-president, Professor T. H. MacBride; Secretary, Professor F. E. Lloyd, Teachers College, Columbia University, New York City.

*Section H—Anthropology.* Vice-president, Professor M. H. Saville; Secretary, Dr. R. B. Dixon, Harvard University, Cambridge, Mass.

*Section I—Social and Economic Science.* Vice-president, Judge S. E. Baldwin; Secretary, J. E. Crowell, U. S. Department of Agriculture, Washington, D. C.

*Section K—Physiology and Experimental Medicine.* President, Professor H. P. Bowditch; Secretary, Professor F. S. Lee, Columbia University, New York. There will be no meeting of Section K at the St. Louis meeting.

*The American Society of Naturalists.* December 29 and 30. President, Professor William Trelease; Secretary, Dr. Ross G. Harrison, The Johns Hopkins University, Baltimore, Md. *The Central*

*Branch* of the society meets at the same time and place. President, Professor John M. Coulter; Secretary, Professor W. J. Moenkhaus, Indiana University, Bloomington, Ind.

*The Astronomical and Astrophysical Society of America.* December 29, 30. President, Professor Simon Newcomb; Secretary, Professor Geo. C. Comstock, Washburn Observatory, Madison, Wis.

*American Physical Society.* During convocation week. President, Arthur G. Webster; Secretary, Professor Ernest Merriitt, Cornell University, Ithaca, N. Y.

*The American Chemical Society.* December 28, 29. President, Professor John H. Long; Secretary, Professor W. A. Noyes, The Johns Hopkins University, Baltimore, Md.

*The Geological Society of America.* December 30, 31, 1903, January 1, 1904. President, Dr. S. F. Emmons; Secretary, Professor H. L. Fairchild, University of Rochester, Rochester, N. Y. *Cordilleran Section.* San Francisco. January 1, 2, 1904.

*The American Mathematical Society—Chicago Section.* Secretary, Professor Thomas F. Holgate, Northwestern University, Evanston, Ill. *San Francisco Section.* Berkeley, Cal. December 19. Secretary, Professor G. A. Miller, Stanford University, Cal.

*Botanical Society of America.* December 30, 31. President, B. T. Galloway; Secretary D. T. MacDougall, New York Botanical Garden, Bronx Park, N. Y.

*The Central Botanists' Association.* President, Conway MacMillan; Secretary, C. F. Millspaugh, Field Columbian Museum, Chicago, Ill.

*The Botanical Club of the Association.* Probably, at convenient times.

*The Society for Horticultural Science.* December 28, 29. President, Professor L. H. Bailey; Secretary, S. A. Beach, Geneva, N. Y.

*The Fern Chapter.* Time to be announced. President, B. D. Gilbert; Secretary, H. D. House, Botanical Garden, Bronx Park, New York, N. Y.

*The Society for the Promotion of Agricultural Science.* December 28, 29, 30, 31, 1903, January 1, 1904. President, Dr. William Frear; Secretary, Professor F. M. Webster, University of Illinois, Urbana, Ill.

*American Society of Zoologists, Central Branch.* December 29, 30, 31. President, Professor Jacob E. Reighard; Secretary, Professor Frank Smith, University of Illinois, Urbana, Ill.

*The Association of Economic Entomologists.* December 29, 30. President, Professor Mark V.

Slingerland; Secretary, Professor A. F. Burgess, Ohio State University, Columbus, Ohio.

*The Entomological Club of the Association.* At convenient times. President, E. A. Schwarz; Secretary, C. L. Marlatt, Department of Agriculture, Washington, D. C.

*The American Microscopical Society.* December 28, probably. President, T. J. Burrill; Secretary, H. B. Ward, Lincoln, Nebraska.

*Association of Plant and Animal Breeders.* First general meeting. December 29, 30. Chairman of Committee, W. M. Hayes, University Farm, St. Anthony Park, Minn.

*The American Anthropological Association.* December 28, 1903, January 1, 2, 1904. President, Dr. W. J. McGee; Secretary, George H. Pepper, American Museum of Natural History, Central Park, New York City.

*The American Psychological Association.* December 29, 30. President, Dr. W. L. Bryan; Secretary, Professor Livingston Farrand, Columbia University, New York City.

*The Sigma Xi Honorary Scientific Society.* During convocation week. President S. W. Williston; Secretary, Professor E. S. Crawley, University of Pennsylvania, Philadelphia, Pa.

*The National Educational Association, Departmental Presidents.* About January 1, 1903. President, John W. Cook; Secretary, Irwin Shepard, Winona, Minn.

There will meet at Philadelphia:

*The Association of American Anatomists.* December 29, 30, 31. President, Professor G. S. Huntington; Secretary, Professor G. Carl Huber, University of Michigan, Ann Arbor, Mich.

*The Society for Plant Morphology and Physiology.* December 29, 30, 31. President, Professor Roland Thaxter; Secretary, Professor W. F. Ganong, Smith College, Northampton, Mass.

*The Society of American Bacteriologists.* December 29, 30. President, Professor H. W. Conn; Secretary, Professor E. O. Jordan, University of Chicago, Chicago, Ill.

*The American Physiological Society.* December 29, 30. President, Professor R. H. Chittenden; Secretary, Professor F. S. Lee, Columbia University, New York City.

There will meet at Princeton:

*The American Philosophical Society.* December 29 and 30. President, Professor Josiah Royce; Secretary, Professor H. N. Gardiner, Smith College, Northampton, Mass.

There will meet in New York:

*The American Mathematical Society.* Columbia University. December 28 and 29. President, Professor Thomas S. Fiske; Secretary, Professor F. N. Cole, Columbia University, New York City.

#### THE ACADEMY OF SCIENCE OF ST. LOUIS.

At the meeting of November 16, 1903, twenty-three persons present, Professor A. W. Greeley, of Washington University, presented a report on experiments on the nature of the contraction of muscle. These experiments were undertaken with the view of working out more fully the mechanism involved in the galvanotropic and chemotropic reactions of *Paramœcia* in acid and alkaline media, as described in Professor Greeley's report before the academy last spring. In the experiments on the contraction of muscle, it was found that when the medusa, *Gonionemus*, was exposed to the constant current, rhythmical contractions began always on the cathodal side when the medusa was immersed in normal sea water, but that the contractions began on the anodal side in acidulated sea water. Likewise, it was shown that acids induce a phase of contraction, and alkalis a phase of relaxation. It was suggested that these results may throw some light on the supposed electrical nature of muscle contraction, and that they offer additional evidence toward the conclusion that the charge carried by the protoplasmic particles depends on certain definite chemical conditions of the surrounding medium.

WILLIAM TRELEASE,  
Recording Secretary.

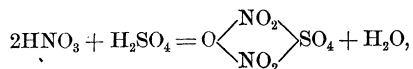
#### AMERICAN CHEMICAL SOCIETY. NEW YORK SECTION.

At the second meeting of the season held November 6, at the Chemists' Club, the following papers were presented:

*Nitro-sulphuric Acid and Its Action on Organic Compounds, Part I.*: C. W. VOLNEY.

Dr. Volney presented the results of both special experiment and long observation on the behavior of nitro-sulphuric acid in the production of nitro compounds and organic nitrates,

especially nitroglycerin and guncotton, and showed that the action of the sulphuric acid is not merely that of a dehydrating agent, to absorb the water formed by the reaction. It was held that the nitric acid is itself dehydrated and condensed, the action being represented by the equation



which would explain satisfactorily the formation of the organic nitrates. The author promised a continuation of this paper in which the reactions will be discussed in detail.

*Meta-amino-benzonitril and Some of Its Derivatives:* H. T. BEANS.

A brief account of the previously published methods of obtaining *m*-amino-benzonitril was given, and a method for its preparation by reduction of the nitronitril with stannous chloride in hydrochloric acid was described. The acyl-, benzoyl-, urea-, thiourea-, oxal- and succinyl- derivatives were prepared and their properties and decompositions studied. The compound was also found to give addition and condensation products with chloral which were described.

*The Proteolytic Cleavage-products of Gelatine:* P. A. LEVENE.

The object of this work was to compare the composition of the intermediate digestion products of proteids. Special attention was paid to the percentage of glycol in gelatine, gelatoses and gelatine peptone. It was found that gelatoses contained in their molecule more glycol, while the peptone contained less glycol, than gelatine. In harmony with this is the observation that in the early stages of digestion, of the final nitrogenous decomposition products only ammonia can be demonstrated, while on prolonged treatment with proteolytic enzymes glycol appears in quantities predominating over other crystalline products of digestion. Among these, besides glycol, were found leucin, glutamic acid and phenylalanin.

*A Device for the Accurate Reading of Burettes:* W. E. CHAMBERLAIN.

Dr. Chamberlain discussed briefly the avoidance of parallax in reading and of the adhesion of drops to the walls, in the use of burettes.

H. C. SHERMAN,  
*Secretary.*

TORREY BOTANICAL CLUB.

At a meeting of the club held at the College of Pharmacy, November 10, 1903, at 8 P.M., the following program was presented:

Mrs. Cunningham, of California, a prominent organizer in that state of clubs for the preservation of wild flowers, was present and by request exhibited a large collection of water-color sketches of California wild flowers and spoke briefly of the best places and seasons for finding them.

The first regular paper was by Dr. Underwood on 'The Botanical Gardens of Jamaica.' He outlined the history and described the present condition of each of the four public gardens of Jamaica, illustrating his remarks with numerous photographs. The first garden established was at Bath in 1779. This is at the eastern end of the island, where the climate is hot and very humid. It was virtually abandoned many years ago, but a number of interesting trees are still standing. The location was not fully satisfactory, and in 1863 another garden was established at Castleton in the Wag Water Valley, twenty-five miles north of Kingston. This is now probably the finest and most interesting botanical garden in the West Indies. It contains a very notable collection of palms, said to include 180 species. In 1868 another garden was established at Cinchona on one of the spurs of the Blue Mountain range at an elevation of nearly 5,000 feet. It was intended to test the practicability of the growing of cinchona for its bark on a commercial scale, but many other trees and plants adapted to high altitudes in the tropics were planted, and for some years it was the headquarters for the botanical work of the island. Owing to its inaccessibility, still another garden was established in 1873 at the Hope plantation in the outskirts of Kingston on the south side of the island. This is now the headquarters for the botanical and agricultural departments of Jamaica, and

besides its features as a botanical garden proper it is used as a nursery for propagating economic plants for distribution to the planters of the island and as an agricultural experiment station for the investigation of various agricultural problems.

The second paper was by Dr. Howe, on 'The So-called Flowering of the Adirondack Lakes,' a phenomenon caused by the growth of one of the minute blue-green algæ, specimens of which were exhibited. The substance of this paper appeared in the October issue of *Torrey*.

Dr. Britton spoke of the recent discovery by Mrs. Goodrich, at Syracuse, of *Phacelia dubia*, a plant new to the New York state flora. This discovery extends the known range of the plant several hundred miles farther north.

On motion, the thanks of the club were voted to Mrs. Cunningham for her interesting exhibition of flower paintings.

F. S. EARLE,  
Secretary.

#### THE SCIENCE CLUB OF THE UNIVERSITY OF WISCONSIN.

The club held its first meeting of the academic year on October 5, President F. P. Turneure in the chair. The paper of the evening was given by Professor Victor Goldschmidt, of Heidelberg University, on 'Recent Developments in Crystallography.' Professor Goldschmidt discussed his recent work on the etching figures formed on calcite crystals and on spheres of calcite when subjected to the dissolving action of acids.

VICTOR LENHER,  
Secretary.

#### DISCUSSION AND CORRESPONDENCE.

##### THE CHEMISTRY OF SOILS AS RELATED TO CROP PRODUCTION.\*

The following quotations will best define the scope of this bulletin of seventy-one pages, and the theses which it is intended to establish and maintain.

Page 7. "The investigations made by the Bureau of Soils during the last ten years have

shown that the economic distribution of crops is dependent mainly upon the physical characters of soils, and upon climate."

Page 13. "Briefly stated, the results given in the following pages appear to show, contrary to opinions which have long been held, that there is no obvious relation between the chemical composition of a soil as determined by the methods of analysis used and the yield of crops; but that the chief factor determining the yield is the physical condition of the soil under suitable climatic conditions."

Page 63. "The exhaustive investigation of many types of soil by very accurate methods of analysis under many conditions of cultivation and cropping, in areas yielding large crops and in adjoining areas yielding small crops, has shown that there is no obvious relation between the amount of the several nutritive ingredients in the soil and in the yield of crops."

Page 64. "It appears farther that practically all soils contain sufficient plant food for good crop yield; that this supply will be indefinitely maintained, and that the actual yield of plants adapted to the soils depends mainly, under favorable climatic conditions, upon the cultural methods; a conclusion strictly in accord with the experience of good farm practice in all countries."

The bulletin contains extended tables showing the results of the analytical work, and at the end, a full description of the methods employed therein.

The above four paragraphs, taken respectively from the beginning and the latter part of the bulletin, summarize the conclusions to which, as it states, 'the Bureau of Soils has been forced.'

These conclusions are certainly startling, to say the least; and perhaps not the least remarkable is the concluding one, which hardly agrees with the impressions left upon the mind of most of those who have made themselves acquainted with the history of agriculture, and its past and present practice in the most advanced civilizations.

Were such statements to emanate from a private laboratory, on a mere personal responsibility, it would be likely to be passed

\* Bureau of Soils Bulletin No. 22, 1903.